

kinematographic and phonographic records of corroborees and ceremonies. The lecture was an outcome of two journeys with Mr. Gillen from Adelaide to the Gulf of Carpentaria; the most important ceremony, not dealt with in their book, referred to certain burial customs, notably the removal of the bones from their first "tree-grave," their burial in an ant-hill, but the reservation of one arm-bone for future elaborate ceremonial, which was shown by the kinematograph.

The session, at which nearly 1000 members and associates were present, closed on January 13.

At the close of the session the "Marine Fish Hatchery and Biological Station," situated in the Otago Harbour, was visited and formally opened, although it is not yet complete. The establishment of this, the first biological station in Australasia, is the outcome of the persistent efforts of Mr. Geo. M. Thomson, of Dunedin.

On the following day a small party—Mr. Hedley, Prof. Benham, and Prof. Kirk—made an excursion to the edge of the "continental shelf," which is about 15 miles due east of the Otago Head, but owing to the rough sea part of the deep-sea dredging gear was carried away as it was being hauled up, and later efforts with other gear resulted in but a small reward for the day's work. The association has made a grant for pursuing this work.

BREWING AND RESEARCH.¹

IN 1901 the great brewing firm of Messrs. Guinness in Dublin instituted a research laboratory, in which the work has been conducted by four trained investigators under the direction of Dr. Horace T. Brown. With characteristic generosity, Messrs. Guinness have rendered the results so far obtained available for other workers in the same field by the publication of a first volume of *Transactions*. Appreciation of these results will by no means be confined to the circle of scientific men technically interested in brewing, for Messrs. Guinness' investigators have been seeking for that exact knowledge which is of permanent scientific value and at the same time affords a basis whereon technical process can be built with some degree of confidence and promise. The problems of the brewer really appeal to a very wide circle; because they are the problems involved in the biological chemistry of the germinating plant and of the yeasts and other lower organisms, they become the problems of the plant physiologist, of the agricultural chemist, and even of the animal physiologist. As Dr. Brown says in his preface, "Could we determine, in the early stages of the germination of a grain of barley, all the 'down grade' chemical changes of the nitrogenous substances stored in the endosperm, and follow the products as they enter the embryonic plant and are once more built up into protein, we should have a key to many obscure problems connected with the life processes of plants and animals."

The first problem dealt with in the present volume is the investigation of the nitrogenous constituents of malt, i.e. of the soluble bodies which are formed by the hydrolysis of the barley protein under the action of the enzymes produced during germination, or which may turn out to be built up from simpler substances as the new plant develops. No one who has not worked amongst that maze of bodies generally "lumped" as amides can appreciate the thick darkness which envelops their separation, and consequently all attempts to appreciate their physiological significance. In the first place Dr. Brown decided upon a critical examination of the various processes which have been proposed for the determination of bodies of the amide and amino acid type; none of the previous results, not even those of Schultze, hitherto the chief worker in this field, have been accepted without examination, and the figures given show the need for revision that existed.

As a result, the Sachsse method, which depends on the hydrolysis of the amide group, and the Sachsse-Korman method, which depends on the reaction of the amide and amino group with nitrous acid, have been improved until they are capable of giving exact results, as tested with pure

specimens of asparagin, aspartic acid, glutamic acid, leucine, tyrosine, alanine, &c. Thus by a combination of the two methods the amount of nitrogen present in a complex mixture as amide and as amino acid can be distinguished and determined. A novel and exact method for the direct determination of tyrosine in such mixtures has also been devised.

Much yet remains to be done before each one of these bodies can be estimated separately, probably, as Dr. Brown indicates, by the application of E. Fischer's esterification method, but the processes here set out with careful detail will be of the greatest possible service to other workers in plant chemistry.

Another old stumbling block has been the want of an accurate method for the estimation of so fundamental a substance as starch; O'Sullivan's method is exact enough, but is too prolonged to be anything but a research method, whereas it is often desirable to repeat starch determinations by the dozen. The volume contains a critical examination of a new starch method, which depends on a preliminary removal of the reducing sugars, &c., with alcohol, followed by hydrolysis to the standard conditions which have already been laid down by Brown and Morris, whereupon the maltose is determined by its cupric reducing power. This method is likely to be of general service in the analysis of a large number of bodies containing starch.

Finally, the volume contains an examination from the plant physiological side of the factors associated with "quality" in barley, including an interesting cytological test of maturation.

The standard of the work recorded in these papers is so high, and their value so great to all others who are engaged with the chemistry of the plant and plant products, that we can only again express our thanks to Dr. Brown and his co-workers, and to Messrs. Guinness for allowing the record of their investigations to be made public. Would there were many great industrial firms with the same enlightened views on research!

A. D. H.

MARINE BIOLOGY.

THE number of the *Journal* of the Marine Biological Association recently issued (new series, vol. vi., No. 4) contains a detailed report on the trawling and other investigations carried out by the association in the bays on the south-east coast of Devon during 1901 to 1902. The report has been prepared for the information of the Devon Sea Fisheries Committee by Mr. Walter Garstang, the naturalist in charge of the fishery investigations of the association, and is based upon a series of experimental trawlings and fish-marking experiments carried out by Dr. H. M. Kyle. The bays investigated are at present closed to trawlers, and as this closure has been found to press somewhat hardly on the smaller fishermen, the Sea Fisheries Committee were anxious to ascertain to what extent it was likely to be beneficial to the fisheries of the district as a whole. The general conclusion arrived at in the report is that, having regard to the permanent maintenance of the fishery, it would appear to be highly inadvisable to rescind the regulation which prohibits trawling in Teignmouth Bay and Torbay, where small fish congregate. On the other hand, there are no biological reasons against the reopening of Start Bay, since small fish are found in inappreciable numbers, whilst large plaice concentrate there during the autumn months.

A particular feature of these experiments was the success attained in the study of the migrations of plaice by marking individual fishes, which were subsequently recovered by the fishermen. Of 349 fish 9 inches and upwards in length marked and liberated in the bays, 96 were subsequently recovered, that is, 27.5 per cent., whilst of 71 fish liberated outside the bays 25 were recovered, or 35.2 per cent. The fishes had in many cases travelled considerable distances.

To the same number of the *Journal* Dr. Petersen, of Copenhagen, contributes a paper entitled "What is Over-fishing?" in which an attempt is made to define the problem now receiving so much attention from those responsible for fishery administration. Dr. Kyle furnishes notes on the physical conditions existing within the line from Start Point to Portland, and a paper on fishing nets,

¹ *Transactions* of the Guinness Research Laboratory, vol. i. part i. Pp. 141. (1903.)

with special reference to the otter-trawl. Mr. R. A. Todd writes on the invertebrate fauna and fish-food of the bays between the Start and Exmouth, Mr. Robert Gurney on the larvæ of certain British Crangonidae, and Mr. Frank Balfour Browne on the eggs and larvæ of Teleostean fishes. The number, which is of larger size than usual, contains three plates and a chart.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Smith's prizes in natural philosophy for Bachelors of Arts are awarded to Mr. E. Cunningham, St. John's; Mr. J. C. M. Garnett, Trinity; Mr. H. A. Webb, Trinity; and Mr. P. W. Wood, Emmanuel. The names are in alphabetical order, and are respectively those of the senior wrangler, sixteenth wrangler, and the two (bracketed) third wranglers in 1902.

The Worshipful Company of Girdlers has made a grant of 100*l.* a year to the university for the endowment of a university lecturer in economics. The appointment is in the first instance for three years.

The general board proposes the appointment of an assistant curator of the Botanical Museum at a stipend of 100*l.* a year.

A special syndicate proposes the establishment in the university of a board of anthropological studies, for the purpose of systematising and directing work in anthropology by advanced students.

Prof. Adami and Prof. Bovey, F.R.S., of McGill University, Montreal, have been appointed representatives of the university at the jubilee of the University of Wisconsin, to be celebrated at Madison in June.

The Senate has adopted an address of sympathy with the University of Turin on the destruction by fire of the Biblioteca Nazionale.

DR. G. E. RICHMOND has been appointed demonstrator of hygiene and public health at University College, London.

THE Misses Riddell, of Beckmount, Belfast, have presented 5000*l.* to Queen's College, Belfast, for the establishment of a Riddell demonstratorship of pathology.

We learn from *Science* that Lord Strathcona has given 4000*l.* to Manitoba University to extend its scientific work, and that Mr. John A. Creighton has given a further sum of about 50,000*l.* to Creighton University, a Catholic institution at Omaha, Nebraska.

THE death is announced, at the early age of thirty-nine, of Dr. E. A. de Schweinitz, director of the Biochemical Laboratory of the U.S. Department of Agriculture, dean of the Medical Department of Columbia University, and well known for his contributions to bacteriology.

A BILL on higher education has, says a *Times* correspondent, been introduced in the Second Chamber of Holland by Dr. Kuyper. The Bill has for its object the granting to private universities, under certain guarantees, of the same rights and privileges as are accorded to the State universities, including the faculty of conferring degrees upon students wishing to enter the public service. The Premier, it appears, attaches great importance to this piece of legislation, and the *Standaard*, the recognised organ of his party, has already threatened the resignation of the Cabinet should the Government fail to obtain a majority in the final division.

THE authorities of the Yorkshire College, Leeds, have received a letter from the Committee of the Privy Council to announce that the committee "see no reason to modify their opinion that the proper title to be assumed by a university with its seat in Leeds is the University of Leeds." Their lordships have recommended to His Majesty the restriction of the title, both on the score of precedent and convenience. The Charter will now soon be laid on the table of the House of Commons, and it is not expected there will be any further delay in the matter. The movement for a new university at Leeds, towards establishing which some 40,000*l.* has been promised, has been throughout regarded as a county move-

ment. The West Riding County Council has promised something like 6000*l.* in the aggregate annually towards the Leeds and Sheffield Universities.

IN a lecture at University College, London, on the universities and colleges of the United States, Dr. T. Gregory Foster, one of the members of the Mosely Education Commission, referred to social and industrial conditions as affecting university life. He pointed out that at every university and college he visited—whether at ancient Yale and Harvard or at the infant University of Chicago, or at the State universities—at all alike one found rich and poor. Each university issued a leaflet to show how the poor man could pay, or help to pay, his way during the university course without loss of caste. Business men in the United States are glad to employ men who have more than a common school or high school education. There is a certain prospect of employment for all who have passed through a university course.

THE Committee of the Privy Council has considered the case presented on behalf of the petition of the University College of Sheffield praying for the grant of a Charter incorporating a university in Sheffield and the resolutions in its support adopted by various bodies. The committee understands that the promoters are engaged in raising a sum of 170,000*l.* for the purposes of the university, by the appropriation of part of which new buildings of a suitable character will be in readiness by the spring of 1905, and that in addition to a considerable yearly sum which the city council has promised to provide, material assistance may be looked for from the county council of the West Riding of Yorkshire, and probably from Derbyshire and the large urban communities in the neighbourhood of Sheffield. In these circumstances their Lordships are willing to entertain favourably the application, and, subject to a substantial realisation of the hopes mentioned, will be prepared to recommend to His Majesty the grant of a Charter in general conformity with the draft accompanying the petition.

MR. LYTTELTON, Secretary of State for the Colonies, was the guest of the Liverpool University Association on March 5 on the occasion of the first dinner under the auspices of the association. The right hon. gentleman, in replying to the toast of his health, said "the object of all education is to endow the mind of the student with strength, accuracy, and elevation. It is well also that such a mind should have power to express its thought with clearness and, if possible, with attractiveness. That is the reason that classical languages have been for so long the main study of the country. But things have altered now. Around and competing with us are all the great communities of Europe, which are becoming more and more organised, intelligent, and specialised in knowledge. Hence has arisen a necessity for the equipment of our young men by study for the immediate struggles of life. We have been frequently met by the criticism that to teach the young to snatch greedily at mental improvement with the sole purpose of disposing at a profit of what has been learned is but a narrow education; but it is well competent for us to learn worthily the great principles which underlie practical professions, and not to despise those principles because they have practical achievement as their result."

MR. GRAY, M.P., has asked in Parliament for an explanation why the Board of Education have recently reduced the value of the national and research scholarships from 30*s.* to 25*s.* per week, and whether, having regard to the desirability of keeping these scholarships open to students unable to supplement them by private means, he would advise the Board to reconsider their decision. In the course of his reply to the question, Sir W. Anson remarked:—"The Board have never intended that these scholarships should be of an eleemosynary character. They believe that the amount of the scholarships is sufficient to attract good candidates, and that in the majority of cases they provide an adequate supplement to the other resources of the students, and they consider that in any cases where more is needed the assistance should be provided under the supervision of local authorities rather than from funds administered by the Board. The students who gain these scholarships have, as a rule, been for a period of years under the direct observation of local school authorities, who thus